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EXAMINER
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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte RONALD S. KARR, OLEG KISELEV,
and ALEX MIROSCHNICHENKO

_____

Appeal 2009-002900
Application 10/722,614
Technology Center 2100

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Decided: October 28, 2009

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Before JAMES D. THOMAS, JEAN R. HOMERE, and
JOHN A. JEFFERY, *Administrative Patent Judges.*

THOMAS, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

    This is an appeal under 35 U.S.C. § 134(a) from the Examiner's final
rejection of claims 1 through 28. We have jurisdiction under 35 U.S.C.
§ 6(b).

    We affirm.

Invention

A method and system are provided for emulating operating system metadata to provide cross-platform access to storage volumes. The method may include generating operating system metadata for a storage device, wherein the operating system metadata emulates a storage volume hosted under a first operating system. The method may further include making the operating system metadata available to a host computer system, wherein the host computer system runs the first operating system. The operating system metadata enables the host computer system to recognize the storage device as the storage volume hosted under the first operating system. (Spec. 31, Abstract; Figs 3-4.)

Representative Claim

1.   A storage subsystem, comprising:

at least one storage device; and

a storage virtualization controller, wherein the storage virtualization controller is communicatively coupled to the at least one storage device, and wherein the storage virtualization controller is operable to:

determine a metadata format usable to access data stored on the at least one storage device under a first operating system, wherein the metadata format is determined in response to a request by a host computer system to access the data, and wherein the metadata format is determined based on the host computer system running the first operating system;

generate operating system metadata in accordance with the
determined metadata format for the at least one storage device,
wherein the operating system metadata emulates a storage volume
hosted under the first operating system; and

send the operating system metadata to the host computer
system, wherein the operating system metadata enables the host
computer system to recognize the storage device as the storage
volume hosted under the first operating system.

Prior Art and Examiner's Rejection

The Examiner relies on the following reference as evidence of
anticipation:

| Rajan | 2004/0030822 A1 | Feb. 12, 2004 |
| | | (filed Aug. 9, 2002) |

Claims 1 through 28 stand rejected under 35 U.S.C. § 102(e) as being
anticipated by Rajan.

Claim Groupings

Appellants argue corresponding limitations of independent claims 1,
14, 27, and 28 collectively. Therefore, we take independent claim 1 as
representative of all of these claims. No other feature of these independent
claims is argued before us. Separate arguments are presented as to
corresponding features of dependent claims 7 and 20 that are argued
collectively. Claim 7 is representative of claims 7 and 20. No other
dependent claims are argued on appeal.

ISSUE

As to representative independent claim 1 on appeal, we characterize the issue as expressed by Appellants in the sentence bridging pages 6 and 7 of the Brief: Have Appellants shown that the Examiner erred in finding that Rajan teaches that operating system metadata is generated in accordance with the determined metadata format for the at least one storage device in response to a request by a host computer system to access the data? This is Appellants' paraphrasal of certain portions of the determining, generating, and sending clauses of representative independent claim 1 on appeal.

FINDINGS OF FACT

With respect to Appellants' characterization of the prior art, Appellants state the following:

> Operating systems differ in how they perform logical partitioning. Most operating systems (e.g., Solaris, Windows, and Linux) use the simple partitioning described above. Some UNIX-based operating systems from HP and IBM, however, do not implement simple logical partitioning in their disk drivers; instead, these operating systems include a virtualization layer that defines logical volumes that can subdivide or span disks in more flexible ways. These logical volumes may be referred to as "host-virtual objects." The virtualization layer used with host-virtual objects may employ complex on-disk metadata, potentially spread across several disks and potentially including additional metadata stored elsewhere, to define a virtual structure. For both simple partitions and host-virtual objects, the storage management function of dividing storage is implemented in host software, and underlying disk storage subsystems are expected basically to supply raw storage containers which are not used directly by file systems or applications.

(Spec. ¶ [0014].)

Evolution in this storage management structure has occurred
through increased complexity of each layer, or by introducing
intermediate layers that emulate the relationships below and above
and leaving surrounding layers unchanged.

(Spec. ¶ [0015], ll. 1-3.)

Second, any partitioning or virtualization schemes that are
specific to a particular operating system may interfere with cross-
platform (e.g., cross-operating-system) access to external storage
volumes. Modem enterprise computing environments may include
computer systems and storage devices from many different vendors.
The computer systems may be operating under different operating
systems, each of which may use its own file system. Different file
systems may each feature their own proprietary sets of metadata
relating to their underlying data objects.

(Spec. ¶ [0018], ll. 1-7.)

PRINCIPLES OF LAW

Anticipation

"A claim is anticipated only if each and every element as set forth in
the claim is found, either expressly or inherently described, in a single prior
art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d
628, 631 (Fed. Cir. 1987). Analysis of whether a claim is patentable over
the prior art under 35 U.S.C. § 102 begins with a determination of the scope
of the claim. We determine the scope of the claims in patent applications
not solely on the basis of the claim language, but upon giving claims their
broadest reasonable construction in light of the specification as it would be
interpreted by one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech.*

Ctr., 367 F.3d 1359, 1364 (Fed. Cir. 2004). The properly interpreted claim must then be compared with the prior art.

ANALYSIS

We refer to, rely on, and essentially adopt the Examiner's findings and reasoning set forth in the Answer, notwithstanding the Examiner's extensive, somewhat encumbered correlations. Our discussion will be limited to the following points of emphasis.

The first sentence of the Abstract reproduced in our invention statement earlier in this Opinion indicates that Appellants' inventive approach is to emulate operating system metadata to provide cross-platform access to storage volumes. The term cross-platform is considered to be synonymous with different operating systems. As an initial claim interpretation aspect of this Opinion, we note that independent claim 1 does not recite different platforms or different operating systems. It is rather directed to only a single "first operating system" associated with a host computer system. As such, from an artisan's perspective, independent claim 1 may not initially appear to read over what Appellants have noted to be already in the state of the art as we have indicated in the Findings of Fact.

Neither the Examiner's correlations of Rajan, nor our independent agreement with them, concur with the allegation made at page 7 of the Brief that the metadata formatting in Rajan is limited to the requirements of the storage operating system installed in a particular storage appliance. As the Examiner's lengthy reasoning approach, initially set forth in the statement of the rejection at pages 3 through 7 of the Answer, indicates two different client operating systems are shown to exist in Figures 1 and 2 of Rajan

operating in parallel for a common multi-protocol storage appliance 100 which the Examiner correlates to the storage virtualization controller of the claims on appeal.

The Examiner's analysis and the showings in Figures 1 and 2 of Rajan are considered entirely consistent with Appellants' disclosed invention and within the ambit of the single operating system of representative independent claim 1 on appeal. Because Rajan's teachings permit his storage virtualization system to operate in accordance with a plurality of different operating systems from clients as host computers as claimed, any request by either client 160a or 160b in Figure 1 would generate operating system metadata in accordance with that determined by the respective requesting operating system or host through Rajan's creation of virtual disks, the discussed vdisk storage object, to a volume in Rajan. As the Examiner has noted, the teachings in paragraph [0035] of Rajan indicate that the storage operating system of Rajan may comprise known operating systems, including those consistent with the respective clients 160a, 160b. Our Finding of Fact confirms that it is known in the art that each operating system has its own metadata for its corresponding file system. Each therefore "sees" data accessible to it in accordance with it. Rajan's common mullti-protocol storage appliance 100 effectively translates the metadata of each such operating system to that of the appliance itself for accessibility.

Representative dependent claim 7 relates to a characteristic of the virtualization controller being able to contain storage properties to identify an offset and a length of a storage volume. The Answer has correlated the respective metadata teachings of Figures 4 and 5 to the data size or claimed length characteristic, as well as the claimed offset as a pointer field in Rajan.

No Reply Brief has been filed to contest any of the Examiner's responsive arguments in the Answer.

CONCLUSION AND DECISION

Appellants have not shown that the Examiner erred in finding that Rajan teaches that operating system metadata is generated in accordance with the predetermined metadata format for the at least one storage device in response to a request by a host computer system to access the data, in accordance with representative independent claim 1 on appeal. Likewise, Appellants have not shown that the Examiner erred in correlating the labeled data storage properties of offset and length in representative dependent claim 7 on appeal to the teachings and showings in Rajan. Therefore, we affirm the Examiner's rejection of claims 1 through 28 under 35 U.S.C. § 102. All claims on appeal are unpatentable.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

msc

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